

# **PATENT**

**INSTITUT FRANÇAIS DU PETROLE**

## **METHOD OF MEASURING LOCAL SIMILARITIES**

### **BETWEEN SEVERAL SEISMIC TRACE CUBES**

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#### **ABSTRACT**

- Method of measuring local similarities between several seismic trace cubes (3D survey) obtained from a volume of an underground zone, corresponding to prestack data or to repeated seismic surveys (4D survey).
- For each point of the volume considered, the method essentially comprises the following stages : a) extracting, from each seismic trace cube, a volume neighbourhood centred on this point, referred to as current point, and consisting of a set of seismic traces in limited number; b) applying an analysis technique referred to as (GPCA) allowing to define synthetic variables; and c) determining a coherence value from the synthetic variables extracted, this coherence value measuring the local similarity between the seismic trace cubes extracted from the volume neighbourhood of the current point; the coherence value thus calculated is assigned to the current point. The coherence values of all of the current points form a coherence cube.
- Applications : finer monitoring of the evolution with time of a reservoir under development for example.